

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International publication date
11 November 2004 (11.11.2004)

PCT

(10) International publication number
WO 2004/097310 A1

(51) International patent classification⁷:
8/00

F24H 1/43,

(72) Inventor; and

(75) Inventor/Applicant (US only): LE MER, Joseph
[FR/FR]; Ty Nod, F-29600 Morlaix (FR).

(21) International application number: PCT/FR2004/000990

(22) International filing date: 23 April 2004 (23.04.2004)

(25) Language of filing: French

(26) Language of publication: French

(30) Data relating to the priority:
03/05,105 25 April 2003 (25.04.2003) FR

(71) Applicant (for all designated States except US): SOCIETE
D'ETUDE ET DE REALISATION MECANQUES
ENGINEERING EN TECHNOLOGIES AVANCEES
[FR/FR]; Zone de l'Aéroport Morlaix, F-29600 Morlaix (FR).

(74) Representative: CABINET REGIMBEAU; Espace
Performance, Bâtiment K, F-35769 Saint Grégoire
Cedex (FR).

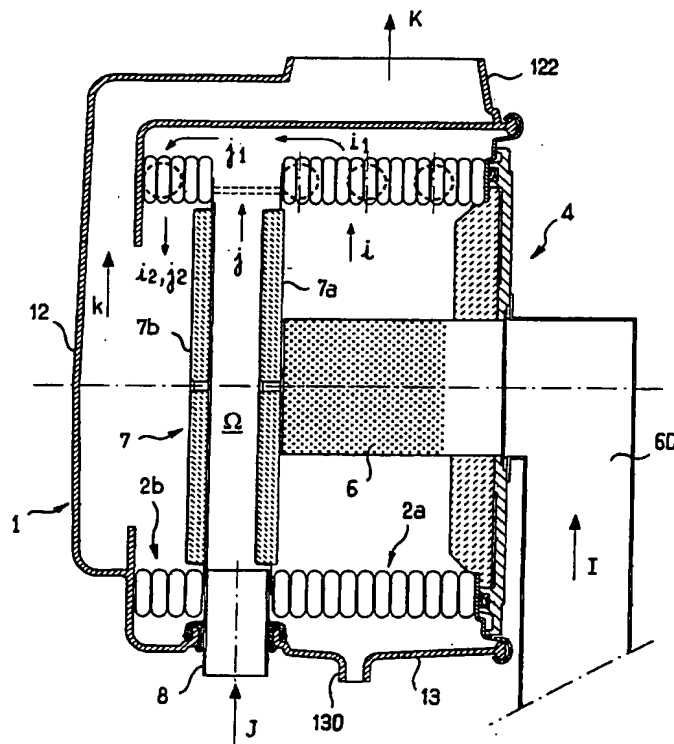
(81) Designated states (unless otherwise indicated, for
every kind of national protection available): AE, AG,
AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY,
BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ,
EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU,
ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,
MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT,
TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[continued on next page]

As printed

(54) Title: CONDENSATION HEAT EXCHANGER

(54) Titre : ECHANGEUR DE CHALEUR A CONDENSATION



(57) Abstract: The invention relates to a condensation heat exchanger. The inventive heat exchanger consists of two co-axial helicoidal tube bundles which are positioned end-to-end, one of said bundles (2a) serving as a primary exchanger and the other (2b) serving as a secondary exchanger. Each of the aforementioned bundles comprises a tube and/or a group of flat tubes which are mounted inside a gas-impermeable casing (1). Moreover, means are provided to circulate at least one fluid to be heated inside the tubes, the casing (1) being equipped with a gas exhaust sleeve (122). In this way, a first hot gas, known as the main gas, which is, for example, generated by a burner (6), passes radially through the voids in the bundles. A deflector system (7) ensures that said main hot gas first passes through the primary exchanger (2a) from inside outwards and, subsequently, the secondary exchanger (2b) from outside inwards, after which it is discharged from the exchanger through the above-mentioned sleeve (122). The deflector (7) comprises two adjoining parallel plates (7a, 7b) which are made from a thermally-insulating material. In this way, a second (additional) hot gas can be introduced between the aforementioned plates in order to heat the fluid circulating in the secondary exchanger or to contribute to the heating thereof. The inventive condensation exchanger is suitable, for example, for domestic use.

[continued on next page]

WO 2004/097310 A1

- (84) **Designated states** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*
- For an explanation of the two-letter codes and the other abbreviations, reference is made to the explanations ("Guidance Notes on Codes and Abbreviations") at the beginning of each regular edition of the PCT Gazette.*

Published:

- *With International Search Report*

(57) **Abbrégé :** Cet échangeur de chaleur comprend deux faisceaux de tubes hélicoïdaux coaxiaux placés bout à bout, dont l'un (2a) fait office d'échangeur primaire et l'autre (2b) d'échangeur secondaire, chacun de ces faisceaux consistant en un tube et/ou en un groupe de tubes plats montés à l'intérieur d'une enveloppe (1) imperméable aux gaz, des moyens étant prévus pour faire circuler au moins un fluide à réchauffer à l'intérieur des tubes, l'enveloppe (1) présentant une manchette (122) d'évacuation des gaz, l'échangeur étant ainsi agencé qu'un premier gaz chaud, dit principal, par exemple généré par un brûleur (6), traverse radialement les interstices desdits faisceaux, un système déflecteur (7) assurant que ce gaz chaud principal traverse d'abord l'échangeur primaire (2a) de l'intérieur vers l'extérieur, puis l'échangeur secondaire (2b) de l'extérieur vers l'intérieur, après quoi il est évacué hors de l'échangeur via ladite manchette (122). Le déflecteur (7) est composé de deux plaques parallèles voisines (7a, 7b) réalisées dans un matériau thermiquement isolant et l'échangeur est ainsi agencé qu'on peut introduire entre ces plaques un second gaz chaud (additionnel) apte à assurer le réchauffage du fluide circulant dans l'échangeur secondaire, ou à contribuer à son réchauffage. Echangeur à condensation, notamment à usage domestique.